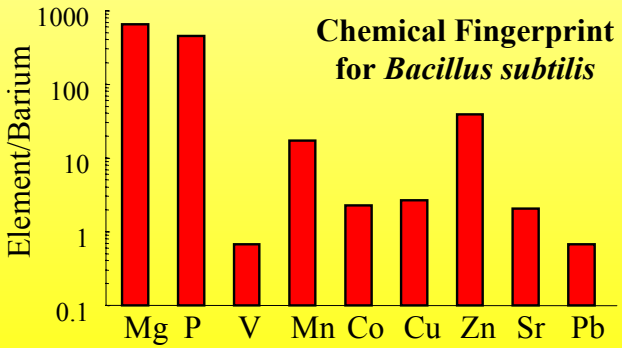
Developing a Material Research Laboratory at Towson University

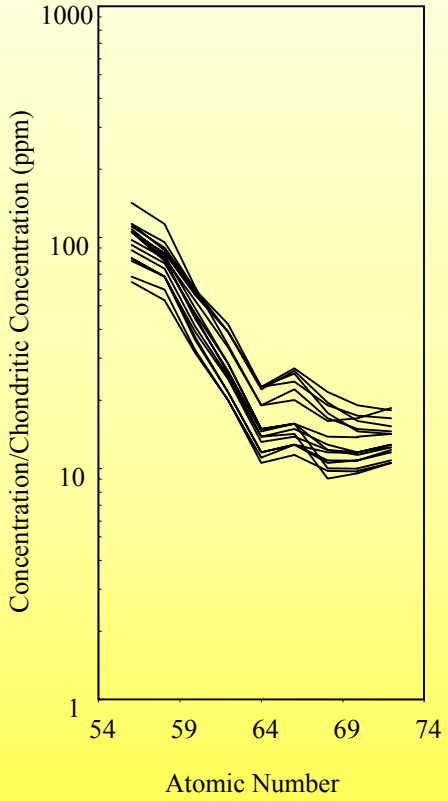
Moolathody Rajeswari, Steven Lev, David Schaefer and Alex Storrs
Towson University
Department of Physics, Astronomy and Geosciences

The Materials Research Laboratory at Towson University funded by ***DMR 0116619*** and Towson University has become the centerpiece of the College of Science and Mathematics. In less than one year the Lab has hosted projects involving biologist, chemists, geologists and physicists. The analytical methods and techniques developed during these diverse investigations are shared and integrated into other projects and serve to foster the collaborative atmosphere that already exists within the College.

The ***MRLT has been working with scientists at the U.S. Army Base at Aberdeen Proving Ground*** to develop methods for the early detection of airborne biological materials. Our efforts to this point suggest that bacterial species can be discerned from ambient conditions using methods developed in the MRLT for the analysis of trace metals using the ICP-MS **[below]**.

Bacillus subtilis **at various stages of sample preparation**





Above is a chondrite normalized plot of Lanthanide group elements from a sequence of petroleum source rocks determined by ICP-MS. The Lanthanides are present at the μg/g level in these rocks and yield information relevant to their geologic history.

MRLT

Materials Research Laboratory @ Towson

In just one year the MRLT has had a ***significant impact*** on the research atmosphere at Towson. ***Undergraduates are leading the way*** with a range of exciting projects a few of which are highlighted below.

Detection and Identification of Bacteria using Inductively Coupled Plasma Mass Spectrometry
Carolyne Gikinju (Chemistry Major);Faculty:D. Schaefer (Physics) (co-PI) and S. Lev (Geology) (co-PI)

Trace Metal Levels in Stormwater Retention Ponds in Maryland
Amanda Shaw (Chemistry Major);Faculty:R.Casey (Chemistry) and S. Lev (Geology) (co-PI)

Determination of Total Phosphorus in Natural Waters by ICP-MS
Jenna Jandorf (Chemistry Major);Faculty:R. Casey (Chemistry)

Development of Biological Assessment and Monitoring Methods for use at U.S. DOE Facilities
Jeff Harmon (Geology Major) and Jeffroy Broughton (Biology Major);Faculty:J. Snodgrass (Biology) and S. Lev (Geology) (co-PI)

Investigating the Origin of Sedimentary Rocks Deposited in the Appalachian Basin, USA
Pat Morton (Geology Major);Faculty:S. Lev (Geology) (co-PI) and J. Filer (Geology)

External Collaborations
U.S. Army SBCCOM Edgewood Area, Aberdeen Proving Ground, MD
U.S. Dept. of Energy, CRESP (Consortium for Risk Evaluation Stakeholder Participation)
Patuxent Wildlife Research Center